Statue of Claims:

1. (previously presented) In a method for improving or planning the improvement of the vision of an eye, the steps of, on a surface model of the cornea of the eye, determining points of focus for different locations on the surface model and modifying the model so as to shift points of focus to a predefined reference axis, without forcing them to a common point, the modified model representing a desired restructuring of the cornea.

2. (previously presented) The method of Claim 1 wherein said modifying step is representative of effectively re-shaping the cornea by one of physically changing its shape and applying to the eye an optical lens intended to correct refractive error.

3. (previously presented) The method of Claim 2 wherein physical changing comprises an intended corneal ablation on the cornea of the eye.

4. (previously presented) The method of Claim 2 wherein the optical lens is one of a contact lens, a cataract lens, a phakic lens an intraocular lens, an intracorneal lens and a spectacle lens.

5. (original) The method of any preceding claim wherein the reference axis passes through the HIGH point.

6. (original) The method of any preceding claim wherein the reference axis is the LOCALZ-AXIS.

7. (previously presented) The method of any preceding claim wherein the surface of the cornea is modeled in terms of a central cap-shaped portion and at least one peripheral band portion radially outward of the cap-shaped portion.

8. (original) The method of Claim 7 wherein there are a plurality of band portions successively radially outward of each other.

9. (original) The method of any one of Claims 7 or 8 wherein a periphery of the cap-shaped portion is at least approximately 4.5 millimeters away from the reference axis.

10. (previously presented) The method of any preceding Claim performed with the aid of computer program which produces the surface model of the cornea, which closely represents at least a portion of the surface of a cornea in three dimensions as a smooth, free-form surface, the modifying step comprising changing the shape of at least a portion of the model to produce a modified surface model.

11. (previously presented) The method of Claim 10, wherein the modifying step corresponds to one of conforming the shape of at least a portion of the cornea to the modified surface model, and conforming the shape of at least a portion of a surface of an optical lens to the modified surface model.

12. (original) The method of any one of Claims 10 or 11 wherein a central cap-shaped portion is modeled on the original surface model as a series of arcs, rotationally spaced about the reference axis and conforming to the surface model, said multiple locations being selected arcs extending between the reference axis and the periphery of the cap-shaped portion, an arc being refocused by: locating the point X at which the perpendicular bisector of a chord between the ends of the arc intersects the reference axis; the distance between point X and the intersection of the reference axis with the surface model being used as a radius to scribe, from point X, a modified arc between the two ends of the arc; and smoothly joining modified arcs to define the modified surface model.

13. (original) The method of any one of Claims 10-12, wherein a band portion, radially outward of a central cap-shaped portion, is modeled on the original surface model as a series of arcs rotationally spaced about the reference axis and conforming to the surface model, said multiple locations being selected arcs extending between peripheries of a band portion, an arc being refocused by: locating the point X at which the perpendicular bisector of a chord between the ends of the arc intersects the reference axis; the distance between point X and the intersection of the reference axis with the surface model being used as a radius to scribe, from point X, a modified arc between the two ends of the arc; and smoothly joining modified arcs to define the modified surface model.

14. (original) The method Claim 12 or 13 further comprising the step of, after generating a modified arc, measuring the maximum distance of that arc from the corresponding

original arc and, if that distance exceeds a threshold value, moving the point X along the reference axis and scribing a new modified arc from moved point X which does not exceed the threshold value.

15. (original) The method of any one of Claims 10-14 further comprising the steps of:

orienting the modified surface model in correspondence with the unmodified surface model;

moving the two models together until they just make contact;

if the point of initial contact is near the center of the modified surface model, moving the two models together further until the periphery of the modified surface model just contacts the original surface model.

16. (previously presented) An optical lens for improving the vision of an eye, the lens comprising areas of focus on a surface thereof corresponding to different locations on the corneal surface of the eye, each area of focus being shaped to shift the focus of the corresponding location of the cornea to a predefined reference axis in the eye, without forcing the focus of each area to a common point.

17. (original) The lens of Claim 16 wherein the lens comprises one of a cataract lens, a phakic lens an intraoccular lens, an intracorneal lens and a spectacle lens.

18. (original) The lens of any one of claims 16 or 17 wherein the reference axis passes through the HIGH point.

19. (original) The lens of any one of claims 16-18 wherein the reference axis is the LOCALZ-AXIS.

20. (original) The lens of any one of claims 16-19 wherein the surface of the lens is constructed as a central cap-shaped portion and at least one peripheral band portion radially outward, with respect to said referenced axis, of the cap-shaped portion.

21. (original) The lens of Claim 20 comprising a plurality of band portions successively radially outward of each other.

22. (previously presented) The lens of any one of Claims 20 or 21 wherein a periphery of the cap-shaped portion is at least approximately 4.5 millimeters away from the reference axis.

23. (original) The lens of any one of claims 16-23 designed with the aid of computer program which produces a surface model of the cornea which closely represents at least a portion of the surface of a cornea in three dimensions as a smooth, free-form surface, the model being modified in shape at each corresponding location at least a portion of the lens conforming in shape to the modified surface model.

24. (original) In a system for improving the vision of an eye by effectively reshaping the cornea by one of controlling physically changing the shape of the cornea and controlling the shape of a lens to be applied to the eye to correct its refractive error, a controller which controls said reshaping so as to shift points of focus for different locations on the surface of the cornea to a predefined reference axis, without forcing the focus of each area to a common point.

25. (original) The system of Claim 24 wherein the lens comprises one of a cataract lens, a phakic lens anintraoccular lens, anintracorneal lens and a spectacle lens.

26. (original) The system of any one of claims 24 or 25 wherein the controller causes reference axis to pass through the HIGH point.

27. (original) The system of any one of claims 24-26 wherein the controller causes the reference axis to be substantially coincident with the LOCAL Z-AXIS.

28. (original) The system of any one of claims 24-27 wherein the controller causes the surface of the lens to be constructed as a central cap- shaped portion and at least one peripheral band portion radially outward, with respect to said referenced axis, of the cap-shaped portion.

29. (previously presented) The system of Claim 28 wherein the controller causes the lens surface to include a plurality of band portions successively radially outward of each other.

30. (previously presented) The system of any one of Claims 28 or 29 wherein the controller causes a periphery of the cap-shaped portion to be at least approximately 4.5 millimeters away from the reference axis.

31. (previously presented) The system of any one of claims 28-30 wherein the

controller makes use of computer program which produces a surface model of the cornea which closely represents at least a portion of the surface of the cornea in three dimensions as a smooth, free-form surface, the controller causing the model to be modified in shape at each corresponding location so that at least a portion of the lens conforms in shape to the modified surface model.

32. (currently amended) ~~A~~ In a method for ~~analyzing the cornea of an eye, including analysis for~~ improving or planning the improvement of the vision of an eye, said method making use of a surface model of the cornea of the eye which closely represents at least a portion of the surface of the cornea in three dimensions as defined with a predefined reference axis, said method comprising the steps of:

a) creating a characterizing curve of the surface model as the intersection between the surface model and a plane containing the reference axis, the characterizing curve being between the axis and a predefined peripheral limit of the surface model;

b) estimating the characterizing curve by a close fitting, substantially circular characterizing arc;

c) rotating the plane about the reference axis and repeating steps a) and b) to create and additional arc, steps a), b) and c) being repeated to created a predetermined number of characterizing arcs representing said surface model; and

d) creating a display of arc radius versus angular position of the plane, as a characterization of the surface model.

33. (previously presented) The method of claim 32, wherein the portion of the cornea is generally cap shaped.

34. (previously presented) The method of claim 32, wherein the portion of the cornea is a peripheral band which, with respect to the reference axis, is outward of generally cap shaped portion.

35. (previously presented) The method of any one of claims 32-34 performed with the aid of computer program which produces the surface model of the cornea to closely represent at least the portion of the surface of the cornea in three dimensions as a smooth, free-form surface.

36. (new) The method of claim 1 wherein, prior to said shifting step the following steps are performed:

a) creating a characterizing curve of the surface model as the intersection between the surface model and a plane containing the reference axis, the characterizing curve being between the axis and a predefined peripheral limit of the surface model;

b) estimating the characterizing curve by a close fitting, substantially circular characterizing arc;

c) rotating the plane about the reference axis and repeating steps a) and b) to create and additional arc, steps a), b) and c) being repeated to created a predetermined number of characterizing arcs representing said surface model; and

said shifting step including changing the radius of at least one characterizing curve.